CLAIMS:

1. A method for recording data in an optical recording medium comprising steps of projecting a laser beam whose power is modulated in accordance with a pulse train pattern including a pulse whose level is set to a level corresponding to a level of a recording power set to be higher than a reproducing power and a pulse whose level is set to a level corresponding to a level of a bottom power set to be higher than the reproducing power onto a write-once type optical recording medium to record a test signal in the optical recording medium, reproducing the test signal and determining an optimum level of the recording power and an optimum level of the bottom power based on the thus reproduced test signal.

2. A method for recording data in an optical recording medium in accordance with Claim 1, which comprises steps of determining pulse train patterns by fixing the recording power at a predetermined level and varying the level of the bottom power, modulating the power of the laser beam in accordance with the pulse train patterns to record first test signals in the optical recording medium, reproducing the first test signals and determining the optimum level of the bottom power based on the thus reproduced first test signals.

3. A method for recording data in an optical recording medium in accordance with Claim 2, wherein the optimum level of the bottom power is determined based on amplitudes of the reproduced first test signals.

4. A method for recording data in an optical recording medium in accordance with Claim 3, wherein the optimum level of the bottom power is determined as a level of the bottom power when the amplitude of the

reproduced first test signal becomes maximum.

5. A method for recording data in an optical recording medium in accordance with any one of Claims 2 to 4, which comprises steps of determining pulse train patterns by fixing the bottom power at the optimum level and varying the level of the recording power, modulating the power of the laser beam in accordance with the pulse train patterns to record second test signals in the optical recording medium, reproducing the second test signals and determining the optimum level of the recording power based on the thus reproduced second test signals.

6. A method for recording data in an optical recording medium in accordance with Claim 5, wherein the optimum level of the recording power is determined based on at least one of jitter and error rates of the reproduced second test signals.

7. A method for recording data in an optical recording medium in accordance with any one of Claims 2 to 6, which comprises steps of determining pulse train patterns by fixing the level of the bottom power at a level substantially equal to the level of the reproducing power and varying the level of the recording power, modulating the power of the laser beam in accordance with the pulse train patterns to record second test signals in the optical recording medium, reproducing the second test signals, tentatively determining the optimum level of the recording power based on the thus reproduced second test signals, determining pulse train patterns by fixing the recording power at the tentatively determined optimum level and varying the level of the bottom power, modulating the power of the laser beam in accordance with the pulse train patterns to

record first test signals in the optical recording medium, reproducing the first test signals and determining the optimum level of the bottom power based on the thus reproduced first test signals.

8. A method for recording data in an optical recording medium in accordance with Claim 7, wherein the optimum level of the recording power is tentatively determined based on at least one of jitter and error rates of the reproduced second test signals.

9. A method for recording data in an optical recording medium in accordance with any one of Claims 1 to 8, wherein the optical recording medium further comprises a light transmission layer, and a first recording layer and a second recording layer formed between the substrate and the light transmission layer, and is constituted so that the at least two recording marks are formed by projecting the laser beam thereonto, thereby mixing an element contained in the first recording layer as a primary component and an element contained in the second recording layer as a primary component.

10. A method for recording data in an optical recording medium in accordance with any one of Claims 1 to 9, wherein data are recorded in the optical recording medium by projecting a laser beam having a wavelength equal to or shorter than 450 nm thereonto.

11. A method for recording data in an optical recording medium in accordance with any one of Claims 1 to 9, wherein data are recorded in the optical recording medium by employing an objective lens and a laser beam whose numerical aperture NA and wavelength λ satisfy $\lambda/NA \leq 640$ nm,

and projecting the laser beam onto the optical recording medium via the objective lens.

12. An apparatus for recording data in an optical recording medium comprising laser beam power modulation pattern determining means for projecting a laser beam whose power is modulated in accordance with a pulse train pattern including a pulse whose level is set to a level corresponding to a level of a recording power set to be higher than a reproducing power and a pulse whose level is set to a level corresponding to a level of a bottom power set to be higher than the reproducing power onto a write-once type optical recording medium to record a test signal in the optical recording medium, reproducing the test signal and determining an optimum level of the recording power and an optimum level of the bottom power based on the thus reproduced test signal.

13. An apparatus for recording data in an optical recording medium in accordance with Claim 12, wherein the laser beam power modulation pattern determining means is constituted so as to determine pulse train patterns by fixing the recording power at a predetermined level and varying the level of the bottom power, modulate the power of the laser beam in accordance with the pulse train patterns to record first test signals in the optical recording medium, reproduce the first test signals and determine the optimum level of the bottom power based on the thus reproduced first test signals.

14. An apparatus for recording data in an optical recording medium in accordance with Claim 13, wherein the laser beam power modulation pattern determining means is constituted so as to determine the optimum

level of the bottom power as a level of the bottom power when the amplitude of the reproduced first test signal becomes maximum.

15. An apparatus for recording data in an optical recording medium in accordance with Claim 13 or 14, wherein the laser beam power modulation pattern determining means is further constituted so as to determine pulse train patterns by fixing the bottom power at the optimum level and varying the level of the recording power, modulate the power of the laser beam in accordance with the pulse train patterns to record second test signals in the optical recording medium, reproduce the second test signals and determine the optimum level of the recording power based on the thus reproduced second test signals.

16. An apparatus for recording data in an optical recording medium in accordance with any one of Claims 13 to 15, wherein the laser beam power modulation pattern determining means is constituted so as to determine pulse train patterns by fixing the level of the bottom power at a level substantially equal to the level of the reproducing power and varying the level of the recording power, modulate the power of the laser beam in accordance with the pulse train patterns to record second test signals in the optical recording medium, reproduce the second test signals, tentatively determine the optimum level of the recording power based on the thus reproduced second test signals, determine pulse train patterns by fixing the recording power at the tentatively determined optimum level and varying the level of the bottom power, modulate the power of the laser beam in accordance with the pulse train patterns to record first test signals in the optical recording medium, reproduce the first test signals and determine the optimum level of the bottom power based on the thus

reproduced first test signals.

17. An apparatus for recording data in an optical recording medium in accordance with Claim 16, wherein the laser beam power modulation pattern determining means is constituted so as to tentatively determine the optimum level of the recording power based on at least one of jitter and error rates of the reproduced second test signals.

18. An optical recording medium comprising a substrate and at least one recording layer disposed on the substrate and being constituted so that data are recorded by projecting a laser beam whose power is modulated in accordance with a pulse train pattern including at least pulses whose levels are set to levels corresponding to a recording power and a first bottom power onto the at least one recording layer to form a recording mark in the at least one recording layer, the optical recording medium being recorded with modulation pattern setting data for setting a pulse train pattern used for modulating a power of the laser beam, which modulation pattern setting data are produced by determining pulse train patterns by fixing the recording power at a predetermined level and varying the level of the bottom power, modulating the power of the laser beam in accordance with the pulse train patterns to record first test signals in the optical recording medium, reproducing the first test signals and determining the optimum level of the bottom power based on the thus reproduced first test signals, determining pulse train patterns by fixing the bottom power at the optimum level and varying the level of the recording power, modulating the power of the laser beam in accordance with the pulse train patterns to record second test signals in the optical recording medium, reproducing the second test signals and determining the optimum level of the recording

power based on the thus reproduced second test signals.

19. An optical recording medium in accordance with Claim 18, which further comprises a light transmission layer, and a first recording layer and a second recording layer formed between the substrate and the light transmission layer, and is constituted so that the at least two recording marks are formed by projecting the laser beam thereonto, thereby mixing an element contained in the first recording layer as a primary component and an element contained in the second recording layer as a primary component.

20. An optical recording medium in accordance with Claim 18 or 19, wherein the modulation pattern setting data are produced by determining the optimum level of the bottom power as a level of the bottom power when the amplitude of the reproduced first test signal becomes maximum.

21. An optical recording medium in accordance with any one of Claims 18 to 20, wherein the modulation pattern setting data are produced by determining the optimum level of the recording power based on at least one of jitter and error rates of the reproduced second test signals.

22. An optical recording medium in accordance with any one of Claims 18 to 21, wherein the modulation pattern setting data are produced by determining pulse train patterns by fixing the level of the bottom power at a level substantially equal to the level of the reproducing power and varying the level of the recording power, modulating the power of the laser beam in accordance with the pulse train patterns to record second test signals in the optical recording medium, reproducing the second test

signals, tentatively determining the optimum level of the recording power based on the thus reproduced second test signals, determining pulse train patterns by fixing the recording power at the tentatively determined optimum level and varying the level of the bottom power, modulating the power of the laser beam in accordance with the pulse train patterns to record first test signals in the optical recording medium, reproducing the first test signals and determining the optimum level of the bottom power based on the thus reproduced first test signals.

23. An optical recording medium in accordance with Claim 22, wherein the modulation pattern setting data are produced by tentatively determining the optimum level of the recording power based on at least one of jitter and error rates of the reproduced second test signals.